

1. BOSC 2017 Nominations

Self Nomination:

Yes

Nominator Information

First Name

Last Name

Nominator Title

Street Address

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State

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Email Address

Phone Number

Mobile Phone

Nominee Information

First Name

Richard

Last Name

Becker

Nominee Title

Senior Toxicologist

Street Address

American Chemistry Council, 700 2nd St., NE

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rick_becker@americanchemistry.com

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Employment Information

Place of Employment/Work:

American Chemistry Council

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Work City

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Work State:

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Work Postal Code

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Work Email Address

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Sector

Industry

Qualifications**Primary Area(s) of Expertise**

Toxicology, risk assessment, alternatives to animal testing, prediction models, method validation

Committee Preference(s)

Executive Committee

Chemical Safety for Sustainability and Human Health Risk Assessment Subcommittee

Statement of Interest

In response to EPA's request for candidates, I would like to express my interest in serving on EPA's BOSCs. Please see my biosketch and contact information below. Thank you for your consideration.

Richard A. Becker is a Senior Toxicologist at the American Chemistry Council (ACC). He leads ACC's Science and Research Division, and directs ACC's Long-Range Research Initiative, an innovative research program designed to modernize and improve chemical safety assessments. From 1999 to 2014 he served in ACC's Regulatory and Technical Affairs Department focusing on emerging health risk science issues, including advanced molecular screening methods in toxicity evaluation and risk assessment, human biomonitoring, sensitive subpopulations, endocrine screening, and tiered testing and alternative test methods. Previously, he held technical and scientific management positions in California state government. Dr. Becker received the Arnold Lehman Award from the Society of Toxicology in 2015 in recognition of his contributions to the field of risk assessment and the regulation of chemicals. Dr. Becker currently serves as a member of the National Research Council's Board on Environmental Studies and Toxicology and has published more than 50 articles in peer reviewed scientific journals. Dr. Becker received his Ph.D. in pharmacology and toxicology from the University of California Irvine and conducted postdoctoral training at the University of Toronto and the International Agency for Research on Cancer. He is a diplomate of the American Board of Toxicology and a member of the Society of Toxicology, the American Chemical Society and the Society for Risk Analysis.

Skills/qualifications related to committee preference(s) specified

I have experience in the following areas:

- Biology: endocrinology (endocrine disruptors), systems biology (AOPs)
- Chemistry: analytical chemistry
- Engineering: risk-based site cleanups
- Public Health: children's health (tiered toxicity testing & risk assessment), interpreting population & sub-

population biomonitoring results in a risk context;

- Exposure Science: evaluating human biomonitoring results)
- Risk Assessment: human health risk assessment
- Toxicology: computational toxicology, HTS assays, prediction models, AOPs, developmental/reproductive toxicology, molecular toxicology, carcinogenesis
- Science Policy: policies, procedures and guidance on evaluation of toxicity data for risk assessment

Other Relevant Information

CV/Resume URL

2. CV/Resume

Please upload your CV/ Resume.

[Becker_short_cv__bio_sketch_March_2017.pdf](#)

3.

BOSC Nomination

Jun 15, 2017 08:16:46 Success: Email Sent to: tracy.tom@epa.gov

4. Thank You for your Submission!

Richard A. Becker, Ph.D., D.A.B.T.
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rick_becker@americanchemistry.com

EDUCATION

- B.A. in Chemistry, Swarthmore College, Swarthmore, PA (1977)
- Ph.D. in Pharmacology and Toxicology, Univ. of California, Irvine, CA (1982)
- Post-Doctoral Fellow, Department of Pathology, University of Toronto, Toronto, Ontario, Canada (research on the pathobiology of cancer with Professor E. Farber (1982-1983))
- Post-Doctoral Fellow, International Agency for Research on Cancer, Lyon, France (research on DNA repair enzymology and carcinogenesis with Drs. Montesano & Tomatis (1983-1985))

CERTIFICATION

- Diplomate, American Board of Toxicology (D.A.B.T) since 1989

PROFESSIONAL SOCIETIES

- Society of Toxicology
- Society for Risk Analysis
- International Society of Regulatory Toxicology & Pharmacology
- American Chemical Society

PROFESSIONAL POSITIONS

- **Senior Director, Long Range Research Initiative (LRI), Science & Research Division, Regulatory and Technical Affairs Dept., American Chemistry Council, May 2014 – Present**
Responsibilities: Lead ACC's Long-Range Research Initiative, an innovative and collaborative research program designed to modernize and improve chemical safety assessments. LRI's research focuses on creating more efficient risk-based priority setting tools, expanding understanding of consumer exposures, improving fit for purpose cell-based assays for chemical safety testing and advancing understanding & use of biological pathways & dosimetry to improve risk assessment methods.
- Senior Director and Senior Toxicologist, Regulatory and Technical Affairs Dept., American Chemistry Council, March 1999 to May 2014 *Responsibilities: Lead the commodity chemical industry's efforts in emerging toxicology, risk science and policy issues such as advanced molecular screening methods in toxicity evaluation & risk assessment, human biomonitoring, children's health risk assessment, endocrine disruptor screening & tiered testing; integrated approaches to testing and assessment and animal welfare issues.*
- Health and Environmental Risk Science Advisor, California Department of Transportation, Nov. 1997 - Feb. 1999
- Deputy Director for Scientific Affairs, Acting Chief Deputy Director and Director, Office of Environmental Health Hazard Assessment (OEHHA), California Environmental Protection Agency, Feb. 1995 - Oct. 1997
- Chief, Human and Ecological Risk Section, Office of Scientific Affairs, Department of Toxic Substances Control, California Environmental Protection Agency, 1990 to 1995; Acting Chief, Industrial Hygiene Section, Office of Scientific Affairs, Department of Toxic Substances Control, California Environmental Protection Agency, 1991 to 1995; Senior Toxicologist / Staff Toxicologist, 1990 to 1991; Staff Toxicologist, State of California Department of Food and Agriculture and Department of Toxic Substances Control, 1987 to 1990
- Director, Mammalian Toxicology Department, SRI International, Menlo Park, CA 1985 to 1987

Biosketch: Richard A. Becker Ph.D., DABT leads ACC's Science and Research Division, and directs ACC's Long-Range Research Initiative, an innovative research program designed to modernize and improve chemical safety assessments. From 1999 to 2014 he served in ACC's Regulatory and Technical Affairs Department focusing on emerging health risk science issues. His scientific activities have focused on advanced molecular screening methods in toxicity evaluation and risk assessment, human biomonitoring, sensitive subpopulations, endocrine screening, and tiered testing and alternative test methods. Previously, he held technical and scientific management positions in California state government. Dr. Becker received the Arnold Lehman Award from the Society of Toxicology in 2015 in recognition of his contributions to the field of risk assessment and the regulation of chemicals and as the lead author, he was awarded the Best Scientific Paper in 2015 for Advancing the Science of Risk Assessment by the Risk Assessment Specialty Section of SOT for the peer reviewed publication (stemming from collaboration of scientists from US, Europe and Canada) entitled "Increasing Scientific Confidence in Adverse Outcome Pathways: Application of Tailored Bradford-Hill Considerations for Evaluating Weight of Evidence." Dr. Becker currently serves as a member of the National Research Council's Board on Environmental Studies and Toxicology and has published more than 50 articles in peer reviewed scientific journals. Dr. Becker received his Ph.D. in pharmacology and toxicology from the University of California Irvine and conducted postdoctoral training at the University of Toronto and the International Agency for Research on Cancer. He is a diplomate of the American Board of Toxicology and a member of the Society of Toxicology, the American Chemical Society, the International Society of Regulatory Toxicology & Pharmacology and the Society for Risk Analysis.

RECENT PUBLICATIONS (2006-2017):

- Becker RA**, Dellarco V, Seed J, Kronenberg JM, Meek B, Foreman J, Palermo C, Kirman C, Linkov I, Schoeny R, Dourson M, Pottenger LH, Manibusan MK. Quantitative weight of evidence to assess confidence in potential modes of action. *Regul Toxicol Pharmacol.* 2017 Feb 20;86:205-220. doi: 10.1016/j.yrtph.2017.02.017. [Epub ahead of print]
- Juberg DR, Knudsen TB, Sander M, Beck NB, Faustman EM, Mendrick DL, Fowle JR 3rd, Hartung T, Tice RR, Lemazurier E, **Becker RA**, Fitzpatrick SC, Daston GP, Harrill A, Hines RN, Keller DA, Lipscomb JC, Watson D, Bahadori T, Crofton KM. 2016. FutureTox III: Bridges for Translation. *Toxicol Sci.* 2017 Jan;155(1):22-31.
- Borgert CJ, **Becker RA**, Carlton BD, Hanson M, Kwiatkowski PL, Sue Marty M, McCarty LS, Quill TF, Solomon K, Van Der Kraak G, Witorsch RJ, Yi KD. 2016. Does GLP enhance the quality of toxicological evidence for regulatory decisions? *Toxicol Sci.* 151(2):206-13. doi: 10.1093/toxsci/kfw056.
- Samuel GO, Hoffmann S, Wright RA, Lalu MM, Patlewicz G, **Becker RA**, DeGeorge GL, Fergusson D, Hartung T, Lewis RJ, Stephens ML. 2016. Guidance on assessing the methodological and reporting quality of toxicologically relevant studies: A scoping review. *Environ Int.* 2016 Jul-Aug;92-93:630-46. doi: 10.1016/j.envint.2016.03.010.
- Cox LA, Popken DA, Kaplan AM, Plunkett LM, **Becker RA**. 2016. How well can in vitro data predict in vivo effects of chemicals? Rodent carcinogenicity as a case study. *Regul Toxicol Pharmacol.* 2016 Jun;77:54-64.
- Kirman CR, Hughes B, **Becker RA**, Hays SM. 2016. Derivation of a No-significant-risk-level (NSRL) for dermal exposures to diethanolamine. *Regul Toxicol Pharmacol.* 2016 Apr;76:137-51. doi: 10.1016/j.yrtph.2016.01.020.
- Beck NB, **Becker RA**, Erraguntla N, Farland WH, Grant RL, Gray G, Kirman C, LaKind JS, Jeffrey Lewis R, Nance P, Pottenger LH, Santos SL, Shirley S, Simon T, Dourson ML. 2016. Approaches for describing and communicating overall uncertainty in toxicity characterizations: U.S. Environmental Protection Agency's Integrated Risk Information System (IRIS) as a case study. *Environ Int.* 2016 Apr-May;89-90:110-28. doi: 10.1016/j.envint.2015.12.031.
- Becker RA**, Patlewicz G, Simon TW, Rowlands JC, Budinsky RA. 2015. The adverse outcome pathway for rodent liver tumor promotion by sustained activation of the aryl hydrocarbon receptor. *Regul Toxicol Pharmacol.* 73(1):172-90.
- Plunkett LM, Kaplan AM, **Becker RA**. 2015. Challenges in using the ToxRefDB as a resource for toxicity prediction modeling. *Regul Toxicol Pharmacol.* 2015 Aug;72(3):610-4. doi: 10.1016/j.yrtph.2015.05.013.

- Borgert CJ, Wise K, **Becker RA**. 2015. Modernizing problem formulation for risk assessment necessitates articulation of mode of action. *Regul Toxicol Pharmacol*. 2015 Aug;72(3):538-51. doi: 10.1016/j.yrtph.2015.04.018.
- Becker RA**, Ankley GT, Edwards SW, Kennedy SW, Linkov I, Meek B, Sachana M, Segner H, Van Der Burg B, Villeneuve DL, Watanabe H, Barton-Maclaren TS. 2015. Increasing Scientific Confidence in Adverse Outcome Pathways: Application of Tailored Bradford-Hill Considerations for Evaluating Weight of Evidence. *Regul Toxicol Pharmacol*. 72(3):514-37.
- Patlewicz G, Ball N, Boogaard PJ, **Becker RA**, Hubesch B. 2015. Building scientific confidence in the development and evaluation of read-across. *Regul Toxicol Pharmacol*. 2015 Jun;72(1):117-33.
- Patlewicz G, Simon TW, Rowlands JC, Budinsky RA, **Becker RA**. 2015. Proposing a scientific confidence framework to help support the application of adverse outcome pathways for regulatory purposes. *Regul Toxicol Pharmacol*. 71(3):463-77.
- Becker RA**, Friedman KP, Simon TW, Marty MS, Patlewicz G, Rowlands JC. 2015. An exposure:activity profiling method for interpreting high-throughput screening data for estrogenic activity--proof of concept. *Regul Toxicol Pharmacol*. 71(3):398-408.
- Patlewicz G, Ball N, **Becker RA**, Booth ED, Cronin MT, Kroese D, Steup D, van Ravenzwaay B, Hartung T. 2014. Read-across approaches--misconceptions, promises and challenges ahead. *ALTEX*. 2014;31(4):387-96.
- Cox LA, Popken D, Marty MS, Rowlands JC, Patlewicz G, Goyak KO, **Becker RA**. 2014. Developing scientific confidence in HTS-derived prediction models: lessons learned from an endocrine case study. *Regul Toxicol Pharmacol*. 69(3):443-50.
- Aylward LL, Hays SM, Kirman CR, Marchitti SA, Kenneke JF, English C, Mattison DR, **Becker RA**. 2014. Relationships of chemical concentrations in maternal and cord blood: a review of available data. *J Toxicol Environ Health B Crit Rev*. 2014;17(3):175-203. doi: 10.1080/10937404.2014.884956.
- Beck NB, **Becker RA**, Boobis A, Fergusson D, Fowle JR, Goodman J, Hoffmann S, Lalu M, Leist M, Stephens ML. 2014. Instruments for assessing risk of bias and other methodological criteria of animal studies: omission of well-established methods. *Environ Health Perspect*. 2014 Mar;122(3):A66-7. doi: 10.1289/ehp.1307727. Erratum in: *Environ Health Perspect*. 2014 Sep;122(9):A234.
- Borgert CJ, Stuchal LD, Mihaich EM, **Becker RA**, Bentley KS, Brausch JM, Coady K, Geter DR, Gordon E, Guiney PD, Hess F, Holmes CM, LeBaron MJ, Levine S, Marty S, Mukhi S, Neal BH, Ortego LS, Saltmiras DA, Snajdr S, Staveley J, Tobia A. 2014. Relevance weighting of tier 1 endocrine screening endpoints by rank order. *Birth Defects Res B Dev Reprod Toxicol*. 2014 Feb;101(1):90-113. doi: 10.1002/bdrb.21096.
- Becker RA**, Hays SM, Kirman CR, Aylward LL, Wise K. 2014. Interpreting estrogen screening assays in the context of potency and human exposure relative to natural exposures to phytoestrogens. *Birth Defects Res B Dev Reprod Toxicol*. 2014 Feb;101(1):114-24. doi: 10.1002/bdrb.21085.
- Juberg DR, Borghoff SJ, **Becker RA**, Casey W, Hartung T, Holsapple MP, Marty MS, Mihaich EM, Van Der Kraak G, Wade MG, Willett CE, Andersen ME, Borgert CJ, Coady KK, Dourson ML, Fowle JR 3rd, Gray LE, Lamb JC, Ortego LS, Schug TT, Toole CM, Zorrilla LM, Kroner OL, Patterson J, Rinckel LA, Jones BR. 2014. t4 workshop report--lessons learned, challenges, and opportunities: the U.S. Endocrine Disruptor Screening Program. *ALTEX*. 2014;31(1):63-78.
- Rhomberg LR, Goodman JE, Bailey LA, Prueitt RL, Beck NB, Bevan C, Honeycutt M, Kaminski NE, Paoli G, Pottenger LH, Scherer RW, Wise KC, **Becker RA**. 2013. A survey of frameworks for best practices in weight-of-evidence analyses. *Critical Reviews in Toxicology* Oct 2013, Vol. 43, No. 9: 753-784.
- Dourson M, **Becker RA**, Haber LT, Pottenger LH, Bredfeldt T, Fenner-Crisp PA. 2013. Advancing human health risk assessment: Integrating recent advisory committee recommendations. *Crit Rev Toxicol*. 2013 July; 43(6): 467-492.
- Stephens ML, Andersen M, **Becker RA**, Betts K, Boekelheide K, Carney E, Chapin R, Devlin D, Fitzpatrick S, Fowle JR 3rd, Harlow P, Hartung T, Hoffmann S, Holsapple M, Jacobs A, Judson R, Naidenko O, Pastoor T, Patlewicz G, Rowan A, Scherer R, Shaikh R, Simon T, Wolf D, Zurlo J. Evidence-based toxicology for the 21st century: opportunities and challenges. *ALTEX*. 2013;30(1):74-103.
- Patlewicz G, Simon T, Goyak K, Phillips RD, Rowlands JC, Seidel SD, **Becker RA**. Use and validation of HT/HC assays to support 21st century toxicity evaluations. *Regul Toxicol Pharmacol*. 2013 Mar;65(2):259-68. doi: 10.1016/j.yrtph.2012.12.008.

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Becker RA, Bergfelt DR, Borghoff S, Davis JP, Hamby BT, O'Connor JC, Kaplan AM, Sloan CS, Tyl RW, Wade M, Marty MS. Interlaboratory study comparison of the 15-day intact adult male rat screening assay: evaluation of an antithyroid chemical and a negative control chemical. *Birth Defects Res B Dev Reprod Toxicol*. 2012, Volume 95, pages: 63–78.

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Borgert CJ, Mihaich EM, Ortego LS, Bentley KS, Holmes CM, Levine SL, **Becker RA**. Hypothesis-driven weight of evidence framework for evaluating data within the US EPA's Endocrine Disruptor Screening Program. *Regul Toxicol Pharmacol*. 2011 Nov;61(2):185-91.

Aylward LL, **Becker RA**, Kirman CR, Hays SM. Assessment of margin of exposure based on biomarkers in blood: an exploratory analysis. *Regul Toxicol Pharmacol*. 2011 Oct;61(1):44-52.

Conrad JW Jr, **Becker RA**. Enhancing credibility of chemical safety studies: emerging consensus on key assessment criteria. *Environ Health Perspect*. 2011 Jun;119(6):757-64.

Pottenger LH, **Becker RA**, Moran EJ, Swenberg JA. Workshop report: identifying key issues underpinning the selection of linear or non-linear dose-response extrapolation for human health risk assessment of systemic toxicants. *Regul Toxicol Pharmacol*. 2011 Apr;59(3):503-10.

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Plunkett LM, Kaplan AM, **Becker RA**. An enhanced tiered toxicity testing framework with triggers for assessing hazards and risks of commodity chemicals. *Regul Toxicol Pharmacol*. 2010 Dec;58(3):382-94.

Becker RA, Janus ER, White RD, Kruszewski FH, Brackett RE. Good laboratory practices and safety assessments. *Environ Health Perspect*. 2009 Nov;117(11):A482-3; author reply A483-4. No abstract available.

Bus JS, **Becker RA**. Toxicity testing in the 21st century: a view from the chemical industry. *Toxicol Sci*. 2009 Dec;112(2):297-302.

O'Connor JC, Marty MS, **Becker RA**, Snajdr S, Kaplan AM. Results of the negative control chemical allyl alcohol in the 15-day intact adult male rat screening assay for endocrine activity. *Birth Defects Res B Dev Reprod Toxicol*. 2008 Apr;83:117-22.

Meek ME, Sonawane B, **Becker RA**. Foreword: Biomonitoring Equivalents special issue. *Regul Toxicol Pharmacol*. 2008 Aug;51(3 Suppl):S3. doi: 10.1016/j.yrtph.2008.02.008.

Hays SM, **Becker RA**, Leung HW, Aylward LL, Pyatt DW. Biomonitoring equivalents: a screening approach for interpreting biomonitoring results from a public health risk perspective. *Regul Toxicol Pharmacol*. 2007 Feb;47(1):96-109.

Becker RA, Plunkett LM, Borzelleca JF, Kaplan AM. Tiered toxicity testing: evaluation of toxicity-based decision triggers for human health hazard characterization. *Food Chem Toxicol*. 2007 Dec;45(12):2454-69.

Becker RA, Borgert CJ, Webb S, Ansell J, Amundson S, Portier CJ, Goldberg A, Bruner LH, Rowan A, Curren RD, Stott WT. Report of an ISRTP workshop: progress and barriers to incorporating alternative toxicological methods in the U.S. *Regul Toxicol Pharmacol*. 2006 Oct; 46(1):18-22.